2023 Bi H1 Q6

Section: DNA and the Genome

Topic: The Structure of the Genome

Question Summary

You are asked which statement about the transfer of genes is true. The options compare horizontal and vertical gene transfer in bacteria and plants.

Worked Solution

Vertical transfer: genes passed from parent to offspring during reproduction (typical of all organisms).
Horizontal transfer: genes passed between individuals of the same generation, e.g. between bacteria using plasmids.
Bacteria can therefore exchange genes both horizontally (plasmids, transformation) and vertically (binary fission).
Plants reproduce only vertically, so they do not use horizontal transfer in the normal sense.

■ Answer: B — Bacteria use horizontal and vertical transfer

Revision Tips

• Horizontal transfer increases genetic variation quickly in prokaryotes.
• Vertical transfer is slower, relying on reproduction cycles.

• Examples:
- Horizontal: antibiotic resistance spreading between bacteria via plasmids.
- Vertical: genetic inheritance from parent to offspring.
• Remember: horizontal = same generation, vertical = next generation.